

DISCUSSION

*Alfred Fox*¹ (*written discussion*)—The authors are to be commended for a real contribution toward providing a better understanding of processes which improve the fatigue strength of metals. At Bell Telephone Laboratories we have been studying the effect of combining extreme cold work and low-temperature heat treatment on the fatigue strength of Copper Alloy 510 (5 percent tin phosphor bronze) strip. We have been able to achieve in this widely used spring material significant increases in the 0.01 percent offset yield strength, good stress relaxation properties, and an improvement in the fatigue strength at 10^8 cycles of approximately 20 percent over that of unheat-treated hard temper material having the same thickness and grain size. While the ductility was significantly reduced by the extreme cold work, the subsequent low-temperature heat treatment restored it to a level satisfactory for many spring applications.

This work, as well as our own unpublished work, shows that processing can do much to improve significantly a metal's fatigue strength.

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